carbonate of lime of the shell is often observed. According to the structure or thickness of the calcareous partitions, this substitution is more or less advanced; sometimes the structure of the shell is more or less well preserved, but frequently it is quite effaced. When the phosphate has invaded the interior of the Foraminifera, and the calcareous partitions have not been touched by the pseudomorphism, the sections of the partitions stand out pure and colourless, showing that the infiltrated matter has penetrated by the foramina; at other times the shell assumes a yellow appearance, showing the first step towards phosphatisation (see Pl. XX. fig. 3). When the filling up of a Foraminifer, for example, and the pseudomorphism of its shell are complete, the phosphate, attracted around this little centre, continues to be added at the surface, and thus a phosphatic granule is formed whose external appearance no longer recalls that of the organism around which the phosphate has grouped itself. This observation is not without importance in the interpretation of the origin of the phosphatic grains. The study of microscopic sections of these Foraminifera confirms a fact often brought out in descriptions of phosphatic fossils, viz., that the infiltration of the phosphate has a direct relation, so to speak, to the fineness of the openings by which this matter must be introduced. Thus a large number of the Foraminifera may be seen to be filled with phosphate, while very often in the fundamental mass at the mouth of the shell there are points where the phosphatisation has not taken place, being still dotted with particles of carbonate of lime showing clearly the optic phenomena of that mineral. It may be said that when the sections of shells of Foraminifera no longer exhibit the black cross between crossed nicols, they are transformed into phosphate.

Sometimes the phosphate of lime takes on an ochreous or brownish tint, showing that it is mixed, as already indicated, with manganiferous and ferruginous matters —its usual accompaniments in marine sediments—or with organic matters. Although the yellowish tint is characteristic, it may also be replaced by a greenish coloration, when it is sometimes difficult to distinguish phosphate of lime from glauconite. Means of distinction, however, may be found in the concretionary forms of the phosphate, giving it a zonary structure, even recalling by its capricious lines an osseous structure at first sight, while, on the other hand, the aggregate polarisation of glauconite affords a means of differentiation, which, after a little practice, may be applied with certainty. In doubtful cases it is well to have recourse to microchemical reaction, when, with the aid of molybdate of ammonia, the question may be decided in a sure and rapid manner.

Distribution and Mineral Associations.—Having described in detail these phosphatic concretions, we may now consider the conditions under which they have been formed. It has already been stated that these nodules were dredged by the Challenger at Stations 141, 142, and 143, after leaving the Cape of Good Hope for the southern cruise. The two former are situated on the Agulhas Bank, on the submarine edge